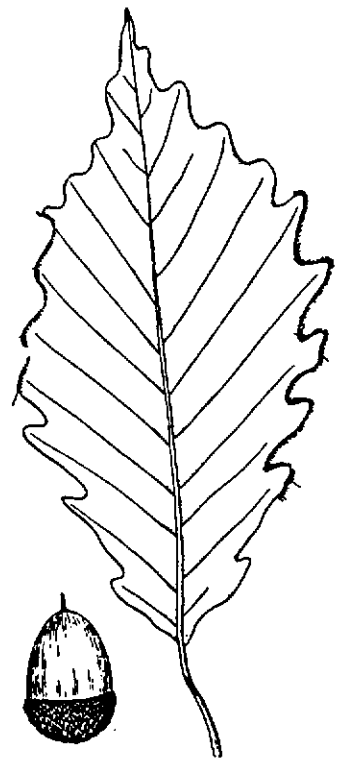
Natural Heritage & Endangered Species Program

Commonwealth of Massachusetts
Division of Fisheries & Wildlife
Route 135
Westborough, MA 01581
(508) 792-7270

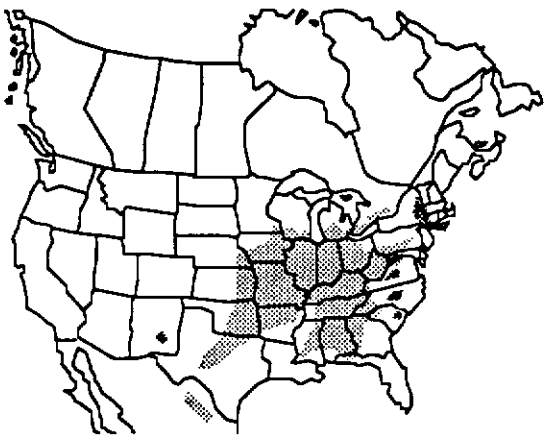
MASSACHUSETTS SPECIES OF SPECIAL CONCERN

YELLOW OAK
(*Quercus muehlenbergii* Engelm.)

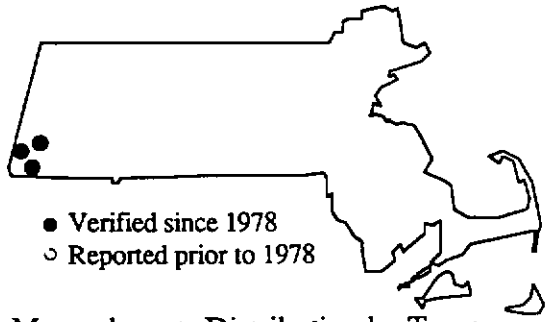


DESCRIPTION: The yellow oak—or chestnut oak—is a member of the white oak subgenus of the Beech family (Fagaceae). This species usually has a straight tapering trunk that extends well into the crown and is commonly broadly buttressed at its base. The crown is made up of many rather short branches and tends to be narrow, with a rounded or somewhat flattish top. The root system is shallow. In the forest, this oak may attain a height of 30 m (about 90 ft.), but in the open it seldom exceeds 10 m (about 35 ft.) in height and 0.5 m (about 2 ft.) in diameter. Its bark is thin, light gray and, with age, becomes flaky. The oblong or lanceolate leaves are 10–20 cm (4–8 in.) long, dark or yellowish-green above, and densely hairy and whitish below. Each leaf has a pointed apex and from 8–14 sharp, pointed teeth on each side. (These leaves somewhat resemble those of the American chestnut.) The 12–20 mm (12/25–20/25 in.) long, sessile or short-stalked acorns have 1–2 cm (2/5–4/5 in.) wide cups that may enclose as much as half the length of the nut. The acorn matures in one season, is borne solitary or in pairs, and ripens in September of October. Several animals eat the yellow oak's sweet acorns—including squirrels, deer, turkey, voles, and mice. Native Americans used the nuts to make acorn meal and flour. The bark is known to be eaten by beaver. Yellow oak flowers from late May to early June. In Autumn, its leaves turn orange and scarlet.

Britton, N.L. & Brown, A. Illustrated Flora of the Northern US & Canada. Dover, 1970.



Documented Range of Yellow Oak



Massachusetts Distribution by Town

RANGE: Yellow oak is predominantly a tree of the eastern half of the United States. Its range has been documented as extending from Massachusetts, western Vermont and southern Ontario to southeastern Minnesota and southeastern Nebraska, and south to northern Florida, Alabama and Texas. This range is not continuous, however. (See North American range map.) Disjunct populations also occur in southeastern New Mexico and northeastern Mexico.

SIMILAR SPECIES IN MASSACHUSETTS: Dwarf chinquapin oak (*Quercus prinoides*) is somewhat similar in appearance to yellow oak and hybridizes with it. Nevertheless, dwarf chinquapin is a shrub that seldom reaches over 3 m (10 ft.) in height. The chestnut oak (*Q. montana*) is another oak that hybridizes with and resembles yellow oak. However, the buds of chestnut oak are longer—6.4–8.5 mm (6/25–9/25 in.) long. Those of yellow oak do not exceed 4.8 mm (5/25 in.). In addition, the leaves on chestnut oak have rounded teeth, and its bark is dark-colored. Swamp white oak (*Q. bicolor*), another similar species, has obovate (egg-shaped with the narrow-end down), more deeply lobed leaves and grows in wetland habitats.

HABITAT IN MASSACHUSETTS: Yellow oak is a forest species that prefers dry, calcareous soils. It will tolerate moderate shade in the seedling stage. However, as it matures, it becomes more shade intolerant. In Massachusetts, it grows as an occasional component of hemlock-hardwood forests, but only on limestone outcrops in the southwestern corner of the state. Habitats include ledges of an old limestone quarry, wooded slopes with limestone outcrops, forested lime cobbles, limestone knolls and a forested, domed outcrop of rock. Among the plants associated with yellow oak are sugar maple (*Acer saccharum*), white ash (*Fraxinus americana*), red oak (*Quercus rubra*), eastern hop-hornbeam (*Ostrya virginiana*), white pine (*Pinus strobus*), and eastern red cedar (*Juniperus virginiana*). Rare Massachusetts plants that have been found with yellow oak include hairy beard tongue (*Penstemon hirsutus*), variegated horsetail (*Equisetum variegatum*), black maple (*Acer nigrum*), smooth rock-cress (*Arabis laevigata*), barren strawberry (*Waldsteinia fragarioides*), narrow-leaved vervain (*Verbena simplex*) and purple cliff-brake (*Pellaea atropurpurea*).

POPULATION STATUS IN MASSACHUSETTS: Yellow oak is presently listed as a species of "Special Concern" in Massachusetts. A "Special Concern" species is rare and could become Threatened—due to an ongoing population decline, small numbers of the species, or limited habitat. As with all species listed in Massachusetts, individuals of the species are protected from take (picking, collecting, killing...) and sale under the Massachusetts Endangered Species Act. There are 13 current stations (discovered or relocated since 1978) in three towns in Berkshire County (Egremont, Great Barrington, & Sheffield). Reasons for yellow oak's rarity in the state include limited suitable habitat and the fact that Massachusetts is at the northeastern limit of its range.

Threats to yellow oak include shading by shade-tolerant trees such as hemlock (*Tsuga canadensis*). A variety of diseases and insects attack yellow oak, but seldom kill a tree, unless there are other stress on the individual, or the infestation continues for several years. These include Oak wilt (*Ceratocystis fagacearum*), a vascular disease of oaks. Insects may defoliate, bore into the bole, or attack and destroy acorns. Defoliating insects include the gypsy moth (*Lymantria dispar*), the orangestriped oakworm (*Anisota senatoria*), and the variable oakleaf caterpillar (*Heterocampa manteo*); boring insects include the carpenterworm (*Prionoyxstus robiniae*), little carpenterworm (*P. macmurtrei*), white oak borer (*Goes tigrinus*), Columbian timer beetle (*Corthylus columbianus*), oak timerworm (*Arrhenodes minutus*), and twolined chestnut borer (*Agrilus bilineatus*); and destructive acorn insects which include acorn weevils (*Curculio* spp.), larvae of moths (*Valentinia glandulella* and *Melisopus latiferreanus*), and gallforming cynipids (*Callirhytis* spp.).

Yellow Oak is also considered rare in Connecticut, Delaware, Maryland, North Carolina, New Jersey, New Mexico and Vermont.

MANAGEMENT RECOMMENDATIONS: Yellow oak regeneration requires a somewhat open canopy allowing for sunlight to reach the forest floor. As with most rare plants, exact needs for management of Yellow oak are not known.

CC-1994

Partially funded by a grant from DEM Forest Stewardship Program